

U.S. PATENT APPLICATION

For

METHOD FOR CAPTURING OF REAL-TIME IMAGE

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METHOD FOR CAPTURING OF REAL-TIME IMAGE

~~Technical Field~~

[0001] The present invention relates to a method ~~for~~ allowing a user terminal to capture of an image recorded in various media in real-time. More particularly, the present invention relates to services wherein a user terminal captures a code image recorded in various on-line/off-line media in real-time, decodes the code value, ~~to decode a code value~~ and obtains desired information using that decoded code value.

~~Background Art~~

[0002] Recently, multimedia ~~is~~ has been used in various portable terminals ~~and~~ systems. A variety of contents are provided and utility services are activated, using such multimedia. In particular, the ~~functionability to~~ of picking up and to editing a motion picture becomes ~~versatile~~ available in most home appliances due to the spread of the use of digital cameras and camcorders, along with the spread of a digital camera and a camcorder.

[0003] In ~~an~~ existing still image decoding systems, in the event ~~that~~ an image is captured in real-time, a still image capture using the ~~snap~~ snapshot is used. That is, in the case where a motion picture is captured, the image is captured in a compressed JPEG format, ~~which results~~ resulting in a data transfer rate reduction ~~in the data transfer rate~~. If a user desires to store the image in real-time, a problem occurs in that the image is broken. This is

due to the rate in which images are stored, which is approximately every $1/15$ of a second. In addition, users become inconvenienced ~~if it is desired to store the still image in real time, an image of one frame is stored approximately every $1/15$ seconds. Thus, there occurs a problem in that the image is broken. Further,~~
5 when capturing the image in real-time, ~~a user feels inconvenient~~ due to a reduced sensible rate.

[0004] A process of capturing a still image and processing the image ~~using it~~ in the related art will now be described in detail with reference to FIG. 9.

[0005] A method for capturing a pause image of one cutting in a portable
10 terminal having an image capture means such as a CCD camera is as follows.

[0006] A preview screen is executed on a viewfinder and a user then confirms the preview screen while viewing the viewfinder (S901).

[0007] If the user catches a desired object while executing the preview screen (S903), the user is able to captures ~~a sheet of a snap-shot~~ using a pickup input button, or its equivalent ~~etc.~~, provided on ~~in~~ the device. ~~In the above,~~ In its dictionary meaning, the term snap-shot refers to thean ~~an~~ instant pickup of a moving object or its picture, as a dictionary meaning. ~~In other words,~~
15 ~~if~~ In order to capture a still image, the user: 1) executes the viewfinder ~~the~~ preview screen (S901) on the viewfinder; 2) catches the desired object (S903);
20 and 3) ~~and then~~ depresses the pickup input button, so that a pause image of one cutting is instantly obtained from the preview screen (S905).

[0008] The snapshot image captured, ~~as the snap-shot~~ as described above, is usually stored in the user terminal ~~a~~ memory of the user terminal in a

compression format such as JPEG (S907).

[0009] As such, steps ~~from step {S901} to step {S907}~~ belong to ~~describe the~~ a conventional method (S900) for capturing ~~a~~ the still image.

5 [0010] The image data, which ~~were~~is compressed or ~~/~~ stored through the ~~method for capturing the still image~~ still image capturing method (S900), ~~is~~ are secondarily utilized in the user terminal through a subsequent image_ processing_ process (S910). Secondary utilization means that in case of a barcode image, information written in barcode is decoded and is then connected to a corresponding application, ~~so~~and that it can be used ~~to~~as remodeling and to ~~decorate~~ion of the still image through the preview image. Such an image_ processing_ process ~~will be~~ is described as follows:-

10

[0011] ~~An image data that is~~ compressed or ~~/~~ stored in the JPEG format, etc., ~~is~~ are decompressed (S911).

[0012] ~~The~~A snap-shot, being the decompressed image data, is analyzed (S913) and ~~is~~ decoded.

15

[0013] If the snap-shot is successfully decoded (S915), a corresponding result value is returned, thereby completing the image_ processing_ process (S917).

[0014] However, if the ~~snap-shot~~snapshot is unsuccessfully decoded (S915), the process returns to the step of executing the preview (S901) in order ~~to~~ ~~for~~ obtaining a new snap-shot.

20

[0015] In reality, ~~an image data to be decoded~~ ~~has~~ have to be captured to such a degree that a snapshot ~~snap~~ corresponding to an image at the time when

the image is picked up is decodable. ~~Accordingly, it is often the case that a user~~
~~there is~~ ~~may be a case where a user is~~ unskilled in using the device, ~~or due to~~
~~other factors,~~ obtains a still image that is improper for ~~the~~ decoding. ~~due to~~
~~other factors.~~ As a result, ~~That is,~~ the probability that a good and desired snap
5 shot can be obtained ~~at a time,~~ is very low. Therefore, ~~the~~ ~~there is a~~ difficulty
lies in that the user must ~~has to~~ return to the pickup mode several times until
the decoding is successful. Thus the user has to repeat ~~and then repeats~~ the
still image capturing process, ~~of capturing the still image.~~ In this case, there
~~occurs a problem~~ occurs in that preview re-execution ~~of a preview~~ for other
10 purposes becomes ~~is~~ impossible until the image is successfully processed.

[0016] ~~Furthermore, there occurs still~~ Still another a problem occurs in
that normal re-execution of the preview screen is impossible until the image
processing process is successfully performed. —This is because a paused
preview image, which remains in a LCD buffer region, etc., is employed in an
15 image-processing module upon pause of the preview. Another problem occurs
because the ability to update ~~That is, there occurs a problem in that updating of~~
a new preview image is hindered until the ~~before the image-processing-process~~
(S910) ~~process~~ is normally finished. In this case, ~~as~~ the user can do nothing
while the image is being processed, resulting ~~which results in~~ a significant waste
20 ~~in terms of~~ system utilization ability.

[0017] As described above, the method for capturing the still image in
real-time according to the prior art has problems in that significant amounts ~~lots~~
of time and effort ~~ts~~ are wasted ~~required~~ due to the unskilled manipulation of

~~the~~a user terminal;~~;~~ execution of ~~the~~a preview screen is paused until the image-
processing-process is finished;~~;~~ and the user must continuously performs the
snapshot capturing process ~~of capturing the snap-shot~~ until the image is
normally processed.

5 [0018] An inventor of this application filed a patent application (Korean
Patent Application No. 2000-0085811, December 29, 2000), ~~which~~
discloses the configuration of a pattern having code information, and a coded
pattern wherein an image of the pattern is captured using a camera and a code
is extracted from the image and code extraction method thereof. In this patent,
10 a barcode of a two-dimensional structure is captured by various devices each
having a camera and a code is extracted from the barcode.

[0019] Furthermore, the inventor filed a patent application (Korean Patent
Registration No. 10-0323759), ~~disclosing which discloses~~ a device wherein a
specific code is extracted from a pattern image using a mobile communication
15 device having a camera, and information is displayed on the device according to
the code or provided through a communication network, and the method thereof.

[0020] Incidentally, the inventor filed a patent application (Korean Patent
Application No. 2000-0032164, June 12, 2000), ~~disclosing which discloses~~ a
method and system for providing information on an object containing, ~~which~~
20 ~~contains~~ an ID symbol that is physically readable. In the method and system, a
virtual space is searched for information on an object existing in a real space,
information on a predetermined product or the like through a network, and the
search result is then provided to a user.

[0021] The aforementioned prior arts are intended to provide various information and related services over the entire real life by allowing a user terminal to capture a code image, whereas the present invention is intended to provide a method for allowing a user terminal and various systems to capture a code image and process the image in a more advanced manner.

~~*{Disclosure of the Invention}*~~

[0022] Accordingly, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a method for capturing and processing a still image in real-time using various image capture devices such as a CCD camera, a digital camera, etc. -More particularly, an object of the present invention is to ~~rapidly~~ capture rapidly a still image from a preview image upon capture of ~~that~~ the image, ~~to~~ process the captured image, and then ~~to~~ apply the processed image to various applications.

[0023] To achieve the above objects, ~~according to~~ the present invention, ~~there is provided a method~~ provides a method for capturing a predetermined image frame in a system having an image capture means, including the steps of: allowing the image capture means to pause a preview; copying and storing the paused preview image; and after the still image is stored, re-executing the preview before the ~~process of~~ processing the stored image begins.

[0024] Furthermore, if the image that is copied and stored in the still imaging storing step is in a compressed format, the method for capturing the still image in real-time further includes the step of, ~~if the image that is copied~~

~~and stored in the step of storing the still image is a compressed format, of decompressing the image after the preview re-execution step of re-executing the preview, wherein the image processing in the step of decompressing the image does not affect the preview re-execution of the preview.~~

5 [0025] Also, to achieve the above objectives, a method is provided that
~~there is provided a method for capturing~~ a predetermined image frame in a
system having an image capture means, including the steps of: inhibiting a
~~write~~writing into an image buffer region of a image storage unit within the
system; subjecting the image stored in the image buffer region to a Crop and
10 Resize process in order to copy the processed image to other regions of the
image storage unit; and permitting ~~a write~~writing into the image buffer region of
the image storage unit, ~~wherein~~ in a state in which the ~~where~~ an image
preview is continuously activated, a real-time still image is captured by
controllably activating and inactivating ~~the write~~writing of the still image into
15 the image buffer region.

[0026] Furthermore, ~~there is provided a method~~ is provided for that
~~providing~~ services using a code image, including: a code image capture step
using the method for capturing the still image in real-time according to the
present invention; a decoding step ~~of~~ allowing an image processing unit to
20 decode the code image captured through the code image capturing step and to
extract a code value;

[0027] a URL call step of allowing a system browser ~~of a system~~ to call a
URL associated with the code value to a host server associated with the

system; and a step of allowing the host server to search the URL or contents corresponding to the code value, to send the searched result to the system, and then to receive related services from the system.

5 ***{Brief Description of Drawings}***

[0028] Further objects and advantages of the invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

[0029] FIG. 1 is a flowchart of a general application using a preview
10 image in a variety of applications using a camera;

[0030] FIG. 2 is a block diagram illustrating a system having an image capture means according to an embodiment of the present invention;

[0031] FIG. 3 is a block diagram illustrating a system having an image capture means according to another embodiment of the present invention;

15 **[0032]** FIG. 4 is a block diagram illustrating a system having an image capture means according to still another embodiment of the present invention;

[0033] FIG. 5 is a flowchart illustrating a method for capturing a still image according to an embodiment of the present invention;

[0034] FIG. 6 is a flowchart illustrating a method for capturing a still
20 image according to another embodiment of the present invention;

[0035] FIG. 7 is a flowchart illustrating a method for capturing a still image according to still another embodiment of the present invention;

[0036] FIG. 8 is a flowchart illustrating a method for capturing a still

image according to still another embodiment of the present invention; and

[0037] FIG. 9 is a flowchart illustrating a process of capturing and processing a still image in the related art.

5 ~~*Best Mode for Carrying Out the Invention*~~

[0038] The present invention will now be described in detail in connection with preferred embodiments, with reference to the accompanying drawings.

[0039] FIG. 1 is a flowchart illustrating a process of a general application using a preview image in various applications employing an image capture means such as a camera.

[0040] At the start step (S101) of the application, the application is initialized and the image capture means, such as ~~a~~the camera, is initialized. A method for executing an application loop (109) may include a simple repetition method based on an end condition search, as shown in FIG. 1, or a method using a timer in order to repeat tasks within ~~the~~an application loop. In ~~the case of the timer-method using the timer~~, if a timer indicating an event that executes the application loop is called at the application start step (S101) ~~of the application~~, a timer event is generated in a predetermined time interval. Thus, in ~~the timer-method is method~~, the tasks are executed only once when the timer event is generated without repeating various initialization task steps (S103, S105 and S107) within the loop after searching the end condition search step (S107), unlike the simple repetition method based on the end condition search.

Next, if the condition is satisfied in the end condition search step (S107), an end step (S115) is performed. ~~W~~~~That is,~~ whenever the event is generated, the initialization tasks steps (S103, S105 and S107) are executed only once. If the end condition is satisfied in the end condition search step (S107), the process is finished ~~repeated.~~ In addition, ~~and~~ even if the end condition is not satisfied, the process does not repeat the loop.

[0041] If the initialization and the start are accomplished, an image is captured through the image capture means, such as ~~a~~~~the~~ camera (S103). In order to capture an image of one frame through the image capture means ~~such as the camera~~ with a preview image displayed, a variety of methods can be used. The present invention aims at the image_capture_process. A variety of methods are applicable to one system. Further, the present invention aims at an image capture method wherein the image can be selected more rapidly with an interval of some time left in bringing the image. Detailed description will be made in a corresponding portion with reference to the corresponding drawings.

[0042] If the image is captured, the captured image is processed in an image_processing_unit according to a corresponding application (S105). The image is processed in a variety of formats according to ~~the~~a corresponding application. Examples of the application may include a code image recognition application, a motion picture encoding application, a character recognition application, applications such as image decoration and remodeling, and the like.

[0043] After the image_processing_step (S105) is completed~~finished~~, ~~it is determination is made~~ whether to repeat the application loop (S107). If

the end condition is satisfied after searching the end condition of the loop (109), the application is ~~completed~~finished (S115). If the end condition is not satisfied, the process returns to the image_capture process (S103) and the loop is repeated until the condition is satisfied. ~~When an the event that a~~
5 timer event is used in order to repeat the application loop, a corresponding timer is paused to finish repetitive tasks of the loop in the end step (S115).

[0044] The general application using the preview image shown in FIG. 1 includes the loop (109) wherein some steps of an application program are repeatedly performed until a predetermined number or a predetermined condition
10 is satisfied when the programs are executed.

[0045] A method may implement the loop (109) where: ~~The loop 109 may be implemented by a method wherein~~ an event procedure of an application receives the timer event; ~~a method wherein the process exits the loop while continuously performing a "For" sentence;~~ and the like. If the loop is
15 implemented by the method wherein the event procedure of the application receives the timer event, a timer interval is sufficiently given considering a one-time execution time of the loop. If the loop is implemented by the method wherein the process exits the loop while continuously performing the "For" sentence, the loop can be implemented by giving some room to the system
20 considering an adequate sleep time. In this case, the process of starting and ending the timer is not required.

[0046] If the application is finished (S115), the timer is first paused and the preview of the image capture means, such as the camera, is then paused.

Further, if a memory is allocated in the initialization process, the process of releasing the memory may be performed.

[0047] In the present invention, by using the above method, it is possible to perform repeatedly and automatically perform the still image capturing process, process of capturing the still image and to processing the image until the decoding is successful within the device, without performing manual tasks such as additional pickup. This is in contrast to unlike the prior art described with reference to FIG. 9.

[0048] A system to which the application is usually applied, such as the user terminal having the camera, will now be described.

[0049] The system of the present invention has a means capable of capturing an image from of a digital camera, a camcorder, a CCD camera, a photosensor, etc., and preferably refers to a portable wireless device such as a PCS, a cellular phone and an IMT 2000 device having a network transfer means, a notebook, a personal computer, a PDA, an OCR, and the like. That is, the system may include a variety of devices having an image capture means and an image processing means, and all the devices having a communication means. Digital image capture devices such as an existing digital camera and camcorder are also included in the system of the present invention. However, it is, however, to be noted that the system of the present invention is not limited to the aforementioned devices having such the communication means.

[0050] FIG. 2 is a block diagram illustrating the system having the image capture means according to an embodiment of the present invention.

[0051] The system shown in FIG. 2 is an example of a general system, which can capture a still image in real-time. The system includes an image capture module (201) for capturing a variety of images from the outside, a camera IC (203) for processing the captured images outputted from the image capture module, a variety of display units (205) of an image output means such as an LCD, CRT and liquid crystal, a storage unit (207) for storing data such as an image therein, and a control operation unit (215) for controlling the system, wherein the control operation unit has various operations.

[0052] The system shown in FIG. 2 is an example of a system having a CPU whose performance is relatively low. In case of a CDMA or a GSM device using a CPU core of ARM7 series, an image is distributed ~~and~~ processed in the hardware in order to reduce the load of the CPU, and the processed image is outputted to the display unit.

[0053] FIG. 3 is a block diagram illustrating the system having the image capture means according to another embodiment of the present invention.

[0054] The system shown in FIG. 3, unlike that of FIG. 2, is an example of a system having a CPU core of the ARM9 series whose performance is relatively high, ~~unlike the system shown in FIG. 2.~~ In this system, a control operation unit (315) directly controls the display unit (205). If the main function of the control operation unit (315) is ~~an~~ image processing, a system having another control operation unit that is connected to an interface of the control operation unit (315) is possible. ~~In other words, as an example~~ For example, a system in which the main function of the control operation unit (315) is an

image processing and a modem chip is interfaced to the control operation unit (315), is possible. A representative one is 3G technology, which corresponds to a W-CDMA device having a camera, wherein W-CDMA employs CDMA instead of TDMA in order to increase ~~the~~ data transfer rate of the GSM system. The W-CDMA becomes a DS mode in 3G rules of ITU and includes 1x MC (multicast mode) and 3x MC.

[0055] FIG. 4 is a block diagram illustrating the system having the image capture means according to still another embodiment of the present invention.

[0056] The system shown in FIG. 4 is an advanced system in which the relationship between a control operation unit (415), an image capture module (401), a display unit (205) and a storage unit (207) becomes smoother ~~when more smooth~~ compared ~~to with~~ the systems shown in FIGS. 2 and 3. That is, the image capture module (401) can directly control the display unit (205), and the control operation unit (415) can control the image capture module (401) and the display unit (205). In this process, the storage unit (207) can be utilized in a more free and various-varying manner.

[0057] The method for capturing the still image in the systems in FIG. 2 to FIG. 4 will now be described in detail. That is, the image capture process (S103) among various application processes using the camera in FIG. 1 will be described ~~with using~~ the accompanying drawings.

[0058] FIG. 5 is a flowchart illustrating a method for capturing a still image in real-time according to an embodiment of the present invention.

[0059] An image capture means provided on a system pauses a preview

(S501).

[0060] In the preview pause step (S501), in order for an image capture means such as a camera to capture a still image, a preview pause function, if any, is used. If there is no preview pause function, and a preview stop function is used, ~~if there is no the preview pause function.~~

[0061] The image paused in the preview pause step (S501) is moved to the system's storage unit, ~~of the system~~ and a still image is captured from the image (S503).

[0062] In the case where the image capture means, such as a the camera, scatters a preview image on a display unit, —such as an LCD, if a camera preview is paused, a preview image remains in the system's LCD buffer region, ~~of the system.~~ Therefore, if a range that in which the preview is scattered in the LCD buffer region is found, the preview image can be obtained. Generally, the format of the images is the same as, for example, a LCD color representation mode of an RGB format, etc., and the resolution of the image is the same as the resolution of the preview displayed on the LCD. The above will be described in more detail. If the preview is paused, a preview image paused in the LCD buffer region remains. In the present invention, the preview image paused in the LCD buffer region is copied to other storage space on the system so that the image can be used in the image processing process. ~~At this time~~ Currently, the reason ~~why~~ the still image for the image processing is copied to other storage space is because ~~that~~ the image processing ~~process~~ does not affect execution of the preview. ~~In the concrete,~~ the storage space to and in which the preview image

5 paused for the image processing is copied and stored may have only a different address on the memory where the original pause preview image exists. The preview image can be copied and stored in an additional storage space. In a corresponding section, this will be ~~This will be below-described in more detail, in a corresponding section.~~

10 [0063] After the still image capture step (S503), the preview is re-executed before ~~the process of processing of~~ the captured image begins (S511). In the event ~~that~~ the preview is paused using the preview pause function, a preview resume function is executed. To re-execute the preview before the image processing ~~process~~ begins is for minimizing that a screen is broken or paused by first executing the preview since the routine of the subsequent image processing step (S105) is a time-consuming task that requires lots of time.

15 [0064] If the image is captured and the data are transmitted by means of the method shown in FIG. 5, the data transfer rate can increase ~~become rapid~~ and the breakage or screen pause ~~of a screen~~ can be prevented when compared to ~~with~~ the prior art using the compressed image, such as the JPEG format, and using the existing snap-shot.

20 [0065] According to an embodiment of the present invention, the system having the image capture means is the system having the camera IC (203), which directly controls the display unit (205), as shown in FIG. 2. The region where the still image is captured/stored in the still image capture step (S503) is the system storage unit (207) ~~of the system~~, more particularly, a RAM, etc., connected to the control operation unit. The stored image has the same

resolution as an image outputted from the display unit. That is, if the camera preview is paused (S501), an image at the moment when the preview image is paused remains in the image buffer region within the camera IC. It is thus possible to capture rapidly ~~capture~~ the preview image by reading that portion.

5 Further, the paused preview image ~~that is read from the~~ camera IC image buffer region ~~of the camera IC~~ is copied and stored in the storage unit connected to the control operation unit (215). By utilizing ~~these~~ a newly stored image in the image processing, the preview can be normally executed without the effect from the image processing. Usually, the format of these images is the same as
10 the color representation mode shown in the LCD. In addition, the ~~and the~~ resolution of the image is the same as the resolution of the preview displayed on the LCD. Accordingly, an output image recognized by the image capture means undergoes a Crop and Resize process by means of the camera IC and is then outputted on the display unit. In this embodiment, the cropped and resized
15 image is brought.

[0066] ~~In the above,~~ the term Crop refers to ~~the~~ a function of extracting ~~an some~~ images from the entire image. ~~The and the~~ term Resize refers to ~~the~~ a function of changing the size of the entire image.

[0067] According to another embodiment of the present invention, the
20 system having the image capture means is the system in which the control operation unit (315) directly controls the display unit (205), as shown in FIG. 3. The output image of the image capture means, such as ~~a~~ the camera, is stored within the system ~~in the storage unit (207) within the system~~. The ~~output image~~

~~of the camera~~ camera output image, which is a stored original image, goes
through ~~experiences~~ the Crop & Resize process, and is then copied to another
storage unit (207) region. ~~region of the storage unit 207.~~ Usually, the ~~format of~~
~~the image~~ image format is the same as the camera output format, etc. ~~Output~~
5 ~~format of the camera, etc.~~ For example, the format may be a YUV format, etc.
The YUV format is a format often ~~usually~~ used in TV broadcasting, ~~and is~~
conceived on the fact that the human eye is more sensitive to luminance than a
color. ~~In the above,~~ Y indicates the luminance of a color and is sensitive to error.
Thus, Y is coded at an upper bandwidth than are the color elements U and V. U
10 and V refer to chroma. ~~The~~ A typical Y:U:V ratio is 4:2:2, which is also used in
CD-I and DVI.

[0068] FIG. 6 is a flowchart illustrating the method for capturing the still
image according to another embodiment of the present invention.

[0069] ~~The~~ An embodiment shown in FIG. 6 corresponds to the ~~a~~ method
15 ~~that is used~~ when it is desirable ~~to~~ capture an image ~~of~~ with ~~a~~ the resolution
higher than that of a preview image.

[0070] An image capture means provided in a system pauses a preview
(S501).

[0071] In the preview pause step (S501), like in the embodiment of FIG.
20 5 described above, an image capture means, such as a camera, uses a preview
pause function to obtain a still image, if any. ~~If no preview pause function~~
~~exists, a preview stop function is used to obtain the still image, and a preview~~
~~stop function if there is no the preview pause function in order to obtain a still~~

image.

[0072] In the event it is desired to obtain an image with a higher resolution than that of the preview, a Crop and Resize condition is specified and a capture command is issued to the Camera IC 203 (S602). ~~that an image of the resolution higher than a preview size is to obtain, a desired Crop and Resize condition is specified and a capture command is issued to the camera IC 203 (S602).~~

[0073] In this case, ~~the~~ corresponding captured image is stored within the camera IC 203 in an image buffer region, ~~image buffer region existing within the camera IC 203, etc.~~ according to the specified Crop and Resize condition. The image stored with the camera IC's (203) in the image buffer region existing within the camera IC 203 is read through the preview pause step (S501) and ~~the step of issuing the capture command (S602) step,~~ and is then stored in the storage unit (207), so that a ~~the~~ still image is captured (S503). A process such as a subsequent preview re-execution step (S511) is the same as that described above and will not be described further.

[0074] This embodiment corresponds to a method that can be used when an image ~~of the resolution higher~~ having a higher resolution than that of a preview image is to be used, such as, ~~for example, such as~~ when the image capture means ~~output image of the image capture means~~ is used intact.

[0075] FIG. 7 is a flowchart illustrating the method for capturing a realtime, still image ~~the still image in real time~~ according to still another embodiment of the present invention.

[0076] In this embodiment, in a state where the preview image is continuously received instead of the preview pause and re-execution steps in the aforementioned embodiment, a write of the image from an image capture module to a buffer region of a storage unit is inhibited and activated.

5 [0077] That is, this embodiment corresponds to a method wherein a preview is updated as time elapses, but the goes but an image buffer is not updated, and a still image is captured through control of write inhibition and activation.

10 [0078] The system control operation unit ~~of the system~~ controls the system storage unit to inhibit ~~a write~~writing into the image buffer region (701). At this time, the image stored in the image buffer region is subjected to the Crop and Resize process and is thus copied to another system storage unit region ~~of the system storage unit~~. The image copied to the other region is read to obtain the still image (S503).

15 [0079] After the image is copied to the other region, the control operation unit controls the system storage unit to activate ~~a write~~writing into the image buffer region (S711).

20 [0080] In a state where the preview image is not paused and executed but is continuously received as above, the storage unit of the system is controlled to control write inhibition and activation of the image buffer region. It is thus possible to obtain a more rapid still image by comparing the preview image with the still image through the pause and execution.

[0081] FIG. 8 is a flowchart illustrating the method for capturing the still

image in real time according to still another embodiment of the present invention.

[0082] In this embodiment, if an image format that can be obtained from the camera IC, etc. is in a compressed format such as JPEG, an image decompression step (S813) is further added to the image capture process described above.

≪Application Example≫

[0083] The process of capturing and processing an application-related image ~~related to an application~~ will now be described.

10 ***Application Example Using Code Decoder***

[0084] An application is initialized. —At this time, a code decoder is initialized and a camera preview is started. A timer may be called and started, if necessary~~needed~~.

[0085] After ~~the~~ initialization, the image capture unit ~~properly~~ performs the aforementioned still image capture process to capture a still image.

[0086] The image processing unit performs a decoding process to recognize the code by using the still image captured in the image capture unit as an input. The code image decoding process corresponds to the process of extracting a code value through the code image captured in the image capture unit. Such a code decoding process may be executed in a variety of methods depending on the format of the code image. If the ~~code~~ decoding fails, the image capture unit captures a new image. ~~is captured by the image capture unit.~~ If the decoding is successful, the process exits the application loop to finish the

code decoding.

[0087] After a code value is decoded through the code image, if the recognized code value is outputted to the decoder, a browser that supports the HTTP protocol such as a web browser, a WAP browser or a ME browser calls a URL and the URL is then executed.

[0088] The URL called through the browser has the following format:-

[0089] [protocol name]://[host server name]/[switching software name]?[code value factor name]=[code value]

[0090] That is, for example, the URL may have the following format:

10 HTTP://sw.hot-code.com/sw.sap?code=12345678

[0091] In this case, other factors such as the type of a code may be additionally added to the URL.

[0092] In other words, for example, the URL may have the following format:

15 HTTP://sw.hot-code.com/sw.sap?code=12345678&type=EAN

~~[0100]~~ [0093] If the code value is called as above, software of the host server searches a database for the URL corresponding to the transmitted code value and then redirects the URL, or searches the database for contents to be connected and then generates a medium page connected thereto, so that the page can be viewed through a requester's browser.

20 ~~[0101]~~ [0094] Through the above method, a web, WAP, a ME page, a picture, background downloading, bell sound downloading, setting of connected communication sound settings, various virtual machine support applications

such as—a games, VOD, MOD, making a phone call, entry of personal information into an address book, editing of the address book, and other services can be provided to a user on a system browser.

2. Optical Character Recognition

5 ~~[0102]~~~~[0095]~~ Optical Character Recognition (OCR) ~~OCR (Optical Character Recognition)~~ refers to those that letters, symbols, marks, etc., that are printed or hand-written ~~into~~ onto a paper, ~~are~~ recognized by an optical means, and ~~are~~ then converted into computer texts. The OCR scheme includes a pattern contrast method and a stroke analysis method. Recently, the use of a method
10 such as hand-written character recognition has ~~been~~ increased. OCR may use a special read device, ~~but~~ or may use a small-size optical scanner and dedicated software. In a character recognition application, like with the code recognition application described above, after the application is initialized, a character image capture unit properly performs the still image capture process described above
15 to capture a still image.

~~[0103]~~~~[0096]~~ The image processing unit performs the character recognition process through a predetermined method such as the method described above by using the still image captured in the image capture unit as an input. If the character recognition process fails, the image capture unit captures a new
20 image. If the character recognition process is successful, the image capture unit exits the application loop to finish the process.

3. Image Remodeling and Decoration

~~[0104]~~~~[0097]~~ A user can remodel or decorate the still image captured with the

digital camera, the camcorder, etc., using an appropriate tool.

~~[0105]-[0098]~~ That is, after the image is captured as described above, the image processing unit deforms and decorates the still image using image remodeling and decorating~~on~~ tools and then finishes the process.

5 ~~[0106]-[0099]~~ The applications are only exemplary processes of capturing and processing the image related to the application of the present invention. The spirit of the present invention is not limited to the application examples. That is, the method of capturing the still image in real time according to the present invention is not limited to the application examples, but can be applied to a wide
10 range of applications if they falls within the method for capturing the still image in real-time according to the present invention.

~~*Industrial Applicability*~~

~~[0107]-[00100]~~ According to the present invention, a still image is
15 captured in real time through an image capture means such as a CCD camera and a digital camera. More particularly, it is possible to capture and process a still image more rapidly using a preview image when the image is captured.

~~[0108]-[00101]~~ Therefore, the present invention allows a user to perform a code image decoding process more rapidly using the image capture method
20 through a behavior that makes an image such as a code optically touch a camera and to receive services associated with a desired code more rapidly and conveniently. Furthermore, the present invention ~~has an effect that it can be~~ applied to various applications such as character recognition, real-time image

remodeling and editing, etc.